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develop at the start in much the same way as those of other Mammalia, but that their evolution is complicated somewhat by the early appearance of the folds on either side of the mammary area, which grow upward to form the sides and roof of the fossæ, which eventually enclose the nipples. The condition of the still earlier stages of the gland, judging from the general appearance of my sections, must be very similar to that observed in other mammals by Huss, Langer, Kölliker and others.—*John A. Ryder.*

## PHYSIOLOGY.[1]

BACTERIA LITERATURE.—Bacteria, by G. M. Sternberg, M.D. Wm. Wood & Co., N. Y., 1885; Micro-organisms and Disease by E. Klein, M.D., F.R.S., Macmillan & Co., 1884. English-reading students are to be congratulated that two such competent workers as are the authors of these books have not only given accounts of our knowledge concerning bacteria, but have described in sufficient detail their experimental methods so that the laboratory student has but to follow directions in order to enter the field of bacteria research.

Dr. Sternberg's work includes a translation of Megnin's Bacteria, in which are described the morphology, classification and physiology of the germ fungi. But the laboratory student will find particularly valuable the translator's original chapters on technology, germicides and antiseptics, bacteria in infectious diseases and bacteria in surgical lesions. Photo-micrographs form in part the illustrations of the book. To a worker the bibliography alone is more than worth the price of the book.

Photo-micrographs and how to make them, by the same author, is an elaborate and practical aid in this special branch of technology.

The work of Dr. Klein is a reprint of a series of articles which appeared first in the *Practitioner.* In addition to a clear account of methods of research the author gives a copiously illustrated description of the forms of bacteria and a consideration of their relation to disease. Especially valuable are the criticisms on such views as Buchner's concerning the transmutability of pathogenic and non-pathogenic forms.

VASO-MOTOR NERVES.—Recherches Experimentales sur le Système Nerveux Vaso-moteur, Paris, Masson, 1884, pp. 338. Under this title MM. Dastre and Morat collect and publish with considerable diffuseness the results of observations on the functions of the vaso-motor nerves already announced by them during the last five years.

This work does not strike the reader as a very keen criticism of disputed points in this difficult subject, nor is any considerable experimental ingenuity manifested. The method of exposition, however, is admirable and the historical introductions might have been made of much value had the same attention been paid to the literature of other nations as has been given to that of the French. The authors study separately: 1. The innervation of the cutaneous blood-vessels. 2. The dilator-function of the grand-sympathetic. 3. The vaso-dilator nerves of the external ear. 4. The vaso-dilator nerves of the inferior limbs. 5. Influence of the blood of asphyxia on the nervous mechanism of the circulation. The authors are convinced that the slow rhythmic contractions which small arteries, as those of the rabbit's ear can be seen to undergo are not peristaltic, proceeding from the heart outwards, but involve the whole vessel simultaneously. In nearly all nerve trunks containing vaso-motor fibers, as the sciatic, the cutaneous and the sympathetic nerves, the vaso-motor filaments are of two kinds, vaso-dilator and vaso-constrictor. Efferent or centrifugal vaso-motor impulses, like ordinary motor discharges, all leave the spinal cord by way of the anterior spinal nerve roots; on the other hand all afferent or centripetal vaso-motor impulses enter the spinal cord through the posterior spinal nerve roots. The chemical condition of the blood determines largely the vaso-motor coördination between the vessels of the skin and of the viscera; asphyxia produces a dilatation of the vessels of the skin and a simultaneous contraction of those of the viscera. The direct action of dilator nerves traveling in the sympathetic can be demonstrated on the dog; stimulation of the sympathetic nerve in the neck causes flushing of the mouth and face on that side.

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[1] This department is edited by Professor HENRY SEWALL, of Ann Arbor, Mich.

The most valuable part of the work is that which considers the vaso-motor functions of the sympathetic ganglia. The observations indicate that these ganglia are automatic vaso-motor centers from which impulses go out to the muscular coats of the vessels and keep them in a state of tonic contraction. Dilation or, on the contrary, stronger contraction of the vessels is brought about indirectly by either stimulation or inhibition of the activity of the appropriate sympathetic ganglia through impulses reaching these ganglia from the spinal cord along either vaso-constrictor or vaso-dilator spinal nerves. The physiological classification of nerves announced by Borden and by Bichat is still supported by fact; namely, that the cerebro-spinal system presides over the functions of animal life and of relation; while the sympathetic system is concerned with the nutrition and vegetative life of the body.

THE PHYSIOLOGICAL PURPOSE OF TURNING THE INCUBATING HEN'S EGG.—The setting fowl frequently turns her eggs during incubation and when this process is carried on artifically, mechanical means must be adopted to effect the same purpose. M. Dareste finds that during the first week of artificial incubation eggs which are turned develop in essentially the same manner as those which are allowed to rest, but the monstrosities which have already been formed in the latter soon take on an excessive development and in very few eggs which are allowed to remain unmoved during the whole period of incubation does the body cavity of the embryo become closed in. The cause of death in the unmoved eggs is, according to Dareste, the union by growth of the allantois with the egg-yolk which latter is thus prevented from becoming finally absorbed into the alimentary canal preliminary to the closure of the body cavity. These adhesions of the allantois with the vitelline membrane lead to frequent rupture of the latter whose contents are thus largely lost to the embryo. Death of the chick in the unturned eggs usually occurs about the second week of incubation. When the eggs are turned over it is probable that the position of the allantois upon the yolk is shifted and this daily movement prevents adhesion between the two surfaces. Sixteen eggs were placed under the same conditions of artificial incubation, but eight were allowed to remain unmoved while the eight remaining were turned over twice a day. In the first set absorption of the yolk did not occur in any specimen, and all the embryos died in the course of the second or third week. In the second set, in six eggs the yolk was absorbed in the normal manner; in a seventh, opened on the twenty-second day, the chick was alive and hearty and the yolk was being absorbed; in the eighth egg the chick was dead on the twentieth day and adhesion between the allantois and yolk had prevented absorption of the latter.—*Comptes Rendus, 1884, p. 813.*

## PSYCHOLOGY.

PSYCHICAL RESEARCH.—At the Birmingham Midland Institute in November last, Mr. W. H. Myers, M.A., gave a lecture on "Aims and Methods of Psychical Research." The lecturer began by dwelling on the difficulty which the religious and scientific world experience in finding a common ground on which to meet, and pointed out that neither party had made a serious attempt to test the real value of those scattered indications of a psychical element in man which actual experience offers us. He explained that the object of the Society for Psychical Research was to subject all these indications to a fair and unbiased examination on scientific lines. The experiments which had so far been tried consisted mainly in discovering persons of special sensitiveness, and subjecting them to certain influences, either of magnets, &c. (as in the experiments of Reichenbach, of Charcot), or hypnotic or mesmeric passes, or of mere expectant attention, this last possibly inducing some influence at present unknown, as in so-called spiritualistic séances. In the lecturer's view it was at present wholly premature to ascribe the last phenomena to the spirits of the dead. Whatever in them was not due to mere fraud, must wait for an explanation until the simpler phenomena connected with sensitives were much better understood. The lecturer then